

WHAT IS CLAIMED IS:

1. A dielectric film comprising:

an underlying layer toned on a crystalline semiconductor layer and made of a metal material, the affinity of the metal material for oxygen being higher than affinity of a semiconductor material of the semiconductor layer for oxygen; and  
a crystalline CeO<sub>2</sub> film toned on the underlying layer.

2. The dielectric film of claim 1, wherein at least part of the underlying layer has been oxidized.

3. The dielectric film of claim 1, wherein the metal material for the underlying layer is at least one material selected from the group consisting of Mg, Zr, Y, Ce, La and Bi.

4. A dielectric film comprising:

an underlying layer formed on a crystalline semiconductor layer and made of a compound oxide containing a metal element and a semiconductor material for the semiconductor layer; and  
a crystalline CeO<sub>2</sub> layer formed on the underlying layer.

5. The dielectric film of claim 4, wherein the metal material for the underlying layer is at least one material selected from the group consisting of Mg, Zr, Y, Ce, La and Bi.

6. A dielectric film comprising:

an underlying layer formed on a crystalline semiconductor layer and made of a crystalline metal oxide that substantially lattice-matches crystals of the semiconductor on the principal surface of the semiconductor layer; and  
a crystalline CeO<sub>2</sub> layer formed on the underlying layer.

7. The dielectric film of claim 2, wherein the metal material for the underlying layer is at least one material selected from the group consisting of Mg, Zr, Y, Ce, La and Bi.

8. A dielectric film comprising:

an underlying layer formed on a crystalline semiconductor layer and made of at least one metal material selected from the group consisting of Mg, Zr, Y, Ce, La and Bi; and

a ferroelectric layer formed on the underlying layer.

9. The dielectric film of claim 8, wherein at least part of the underlying layer has been oxidized.

10. A dielectric film comprising:

an oxide layer formed on a crystalline semiconductor layer and made of an oxide of a semiconductor material for the semiconductor layer;

an underlying layer formed on the oxide layer and made of an oxide of a metal material; and

a ferroelectric layer formed on the underlying layer.

11. The dielectric film of claim 10, wherein the metal material for the underlying layer is at least one material selected from the group consisting of Mg, Zr, Y, Ce, La and Bi.